

## Longview Lake 1999 Water Quality Report

### 1. General.

a. **Project location.** Longview Dam is located at mile 42.9 on the Little Blue River, a right-bank tributary of the Missouri River. The project is approximately 15 miles southeast of downtown Kansas City, Missouri. The drainage area of the Little Blue River Basin is 224 square miles; 50.3 square miles lie above Longview Dam.

b. **Authorized project purposes.** Flood control, water quality, recreation, and fish and wildlife.

c. **Pertinent data.**

|               | Surface<br>Elevation<br>(ft. above<br>m.s.l.) | Current<br>Capacity<br>(1,000 A.F.) | Surface<br>Area<br>(acres) | Shoreline<br>(miles) |
|---------------|---|-------------------------------------|----------------------------|----------------------|
| Pools         |   |                                     |                            |                      |
| Flood Control | 909.0   | 24.8                                | 1,960                      |                      |
| Multipurpose  | 891.0   | 22.1                                | 930                        | 24                   |
| Inactive      |   | 2.0*                                |                            |                      |
| Total         |   | 46.9                                |                            |                      |

Total Drainage Area: 50 sq. miles

Average Annual Inflow: 28,356 acre-feet

\* Contained in multipurpose pool.

### 2. Activities and studies of the year.

A water quality survey of Longview Lake was conducted by PM-PR-W on June 2, 1999. *In situ* profiling of water temperature, dissolved oxygen (DO), conductivity, pH, and oxidation reduction potential (orp) or redox at one-meter intervals, field measurements of photic zone and secchi depths, and sample collections from the photic zone, sub-surface, and near-bottom were performed at three lake stations. Ambient measurements and surface water collections were carried out in the outlet. Utilizing its mobile and base laboratories, PM-PR-W performed total suspended solids, turbidity, chlorophyll, fecal coliform, and immunoassay herbicide analyses. The Chemical and Materials Quality Assurance Laboratory (CMQAL), Omaha, performed nitrogen and phosphorus group, iron, manganese, and gas chromatographic pesticide analyses.

In addition, an outside contractor performed weekly bacterial analyses (fecal coliform and *E. coli*) on Longview Lake beaches. Results were reported to the Jackson County Parks and Recreation Department (JCPRD), the agency responsible for recreational management of the lake.

### **3. Existing conditions.**

The down lake area (LV-2) was intensely stratified with a 12°C temperature differential between surface and bottom waters in the 19-meter water column. A thermocline was present between 3 and 4 meters. The water column was adequately oxygenated for most aquatic life (>3 mg/L) through 14 meters. In the up lake portions of the Little Blue River arm (LV-9), the lake was also well stratified with a 9.2°C temperature differential between surface and bottom waters in the 9-meter water column. The DO concentrations ranged from 8.5 to 1.3 mg/L. Similarly, the Mouse Creek arm (LV-6) exhibited an 8.2°C differential in the 10-m water column. A thermocline and oxycline were present between 5 and 6 meters. The DO concentrations ranged from 8.4 to 1.9 mg/L.

The lake exhibited good light transparency with photic zones extending to depths of 1.7-2.1 meters. Water clarity in the surface waters was high throughout the small lake with turbidities and suspended solids of 11-15 NTU and 6-12 mg/L, respectively.

The mean total nitrogen ( $\text{NH}_3$ ,  $\text{NO}_2$ ,  $\text{NO}_3$ , and TKN) concentration in the surface waters of the two stations was 0.56 mg/L, which is within an acceptable eutrophy range for the lake. The total phosphorus concentration was 0.07 mg/L at both stations, which exceeds the generalized lake criterion of 0.05 mg/L to reduce algal bloom problems.

With the clear water conditions and the nutrient abundance, algal productivity was slightly elevated as evidenced by the chlorophyll concentrations ranging from 5.9-12.3 ug/L. The 1999 mean chlorophyll concentration for the lake was 10.1 ug/L, which meets the generalized eutrophy criterion.

Four herbicides (atrazine, alachlor, metolachlor, and cyanazine) were present in low concentrations in the July 1998 survey. The mean atrazine concentration was 0.57 ug/L, which is well below the established MCL of 3 ug/L for drinking water supplies. Alachlor was present only in the uplake station at a concentration (0.06 ug/L) well below the MCL of 2 ug/L. Metolachlor was also present only in the uplake area with a mean concentration of 0.13 ug/L. No MCL has been established for metolachlor or cyanazine, which averaged 0.06 ug/L in the lake in July.

Chemical oxygen demand (COD) and total organic carbon (TOC) concentrations were uniformly low throughout the lake at 20 mg/L and 5 mg/L, respectively. Within the anaerobic environment of the hypolimnion, dissolved manganese concentrations were extremely high at 383 ug/L uplake and 925 ug/L downlake. The levels are substantially higher than the 50 ug/L MCL.

The outlet was well oxygenated (9.9 mg/L) in the June survey. Turbidity and suspended solids were low (13 NTU and 9.6 mg/L, respectively), and the other ambient parameters were within acceptable ranges.

#### **4. Future conditions.**

The water quality of Longview Lake is generally good. Problems include the observed heavy metal build-up and oxygen depletion within the hypolimnion during summer stratification. Nutrient imbalance and possible algal blooms during the summer may result from the rapid urbanization of the watershed. The urban setting will also bring high beach utilization and periodic bacterial contamination. Additionally, pesticide contamination is a potential problem due to close urban proximity.

#### **5. Recommendations.**

With the current staffing and funding levels, water quality monitoring of Longview Lake will be limited to a single summer survey in 2000. Bacteriological analysis by an outside contractor will continue to be monitored by JCPRD. Sampling in response to specific emergency problems will be coordinated with the county agency.